

**WHAT IS CLAIMED IS:**

- 1        1. A catalyst ink for a fuel cell comprising a catalytic material and  
2 poly(vinylidene fluoride).
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- 1        2. The catalyst ink of claim 1, wherein the catalytic material comprises Pt.
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- 1        3. The catalyst ink of claim 1, wherein the catalytic material comprises Pt and  
2 Ru.
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- 1        4. The catalyst ink of claim 1, further comprising a second ionomer.
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- 1        5. The catalyst ink of claim 5, wherein the ionomer comprises a liquid  
2 copolymer of tetrafluoroethylene and perfluorovinylethersulfonic acid.
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- 1        6. A process for making a catalyst ink for a fuel cell, comprising mixing  
2 components comprising a catalytic material and poly(vinylidene fluoride).
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- 1        7. The process of claim 6, further comprising adding to the mixture a membrane  
2 plasticizer.
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- 1        8. The process of claim 7, wherein the plasticizer is a high boiling solvent.
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- 1        9. The process of claim 7, wherein the plasticizer is N,N dimethylacetamide.
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- 1        10. The process of claim 6, further comprising adding to the mixture a second  
2 ionomer comprising a liquid copolymer of tetrafluoroethylene and  
3 perfluorovinylethersulfonic acid.
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- 1        11. A process for making an electrode for a fuel cell, comprising:  
2 (a) providing a catalyst ink comprising a catalytic material and poly(vinylidene  
3 fluoride); and

(b) applying the catalyst ink to at least one side of a substrate.

12. The process of claim 11, wherein the substrate is a membrane.

13. The process of claim 12, wherein the membrane is a PSSA-PVDF membrane.

14. The process of claim 11, wherein the ink further comprises a plasticizer.

15. The process of claim 14, wherein the plasticizer is N,N-dimethylacetamide.

16. The process of claim 12, further comprising roughening the surface of the membrane prior to applying the catalyst ink.

17. The process of claim 12, wherein the substrate is a backing.

18. The process of claim 17, wherein the backing is a carbon paper.

19. A process for making a membrane electrode assembly for a fuel cell,

- (a) providing a catalyst ink comprising a catalytic material and poly(vinylidene fluoride);
- (b) applying the catalyst ink to at least one side of a membrane; and
- (c) bonding the membrane to at least one electrode.

20. The process of claim 19, wherein the membrane is bonded to the electrode at a temperature of greater than about 180 °C

21. The process of claim 19, wherein the catalyst ink further comprises a plasticizer.

22. The process of claim 21, wherein the plasticizer is N,N dimethylacetamide.

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1        23. The process of claim 19, further comprising adding to the catalyst ink a  
2 second ionomer comprising a liquid copolymer of tetrafluoroethylene and  
3 perfluorovinylethersulfonic acid.

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1        24. The process of claim 19, further comprising roughening the surface of the  
2 membrane prior to applying the catalyst ink.

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1        25. The process of claim 19, wherein the electrode comprises a catalyst layer  
2 comprising a catalytic material selected from Pt and Pt/Ru and an ionomer.

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1        26. A fuel cell comprising a membrane electrode assembly, wherein the  
2 membrane electrode assembly is made by the process of:

- 3            (a) providing a catalyst ink comprising a catalytic material and poly(vinylidene  
4            fluoride);  
5            (b) applying the catalyst ink to at least one side of a membrane; and  
6            (c) bonding the membrane to at least one electrode.

7